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## (54) A DEVICE FOR CHAMFERING THE END FACES OF ROUND TUBES

(71) I, PER SOMMER of Vingekrogen 3, 2730 Herlev, København, Denmark, of Danish nationality, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a device for chamfering the end faces of circularly cross-sectioned tubes, the device being particularly, but not exclusively, suitable for chamfering the ends of tubes made of plastics materials.

A known tool for this purpose consists of a cylindrical member which fits into the tube in question and is provided with a cutting edge for chamfering the tube internally, externally or both, when the tool is turned in relation to the tube. Thus, a separate tool is required for each size of tube.

Another known tool is provided with a conical number of different sizes of tube. However, use of this tool entails a risk of the member being held in an oblique position in the tube so that the chamfering is uneven.

According to the invention, a device is provided for chamfering an end face of a circularly cross-sectioned tube comprising a block provided with at least one chamfering tool and a plurality of parallel-sided circular slots corresponding to the desired tube dimension. Preferably the slots have a common tangent plane at the position of the chamfering tool.

In each of these circular slots, the end of a tube having a certain diameter and wall thickness can be rotatably received. The tube position is maintained constant in relation to the chamfering tool, as it is guided internally as well as externally. After the chamfering tool has been adjusted suitably, an accurate chamfering of the desired width can be obtained by rotating the tube in the correct slot. The slot having the greater diameter will also preferably have the greatest width, corresponding to the largest wall thickness, and in the common tangent plane the width of the slot will thus be maximum. However, this does not affect the guidance of tubes with smaller dimensions, as these are guided sufficiently well in the corresponding slots which are accurately shaped to the respective tube size, the tube being guided over at least three quarters of its periphery.

If the tube dimensions are close to each other, it may be impossible to make slots for each tube dimension, as the slots would join each other so much that the guidance of the tube ends would be inadequate. However, this problem may be solved, according to the invention, without the necessity of using two or more different devices, since the block may have two or more chamfering tools with respective groups of circular slots, the groups being arranged to intersect each other.

In most cases, the number of chamfering tools will, for reasons of design, be limited to two. The second chamfering tool is preferably positioned in such a way that a substantially right-angled intersection between the slots belonging to the two groups is obtained. If, for example, the block is circular, the two chamfering tools should desirably be placed diametrically opposite one another. In this case, the guidance of each tube end will be fully efficient even if the corresponding slot is broken at certain places by intersection with the slots associated with the second chamfering tool.

A change from internal to external chamfering or vice versa can easily be obtained since the chamfering tool is preferably received in a rectangular hole in the block. When the chamfering tool is removed, turned through 180° and inserted again into the hole, the cutting edge will be orientated oppositely, i.e. the edge will face outwardly for chamfering the inside of the tube end, or inwardly for chamfering the outside of the tube end. After the change the tube has to be rotated in the opposite direction to that previously used, to chamfer the opposite edge of the tube end.

An infinite adjustment of the width of the chamferings may be obtained according to the invention because the axis of the rectangular hole for the chamfering tool is substantially parallel to the sides of the circular slots, and the chamfering tool is slidable in the hole and is fixable in any axial position. When the chamfering tool is slid axially, the width of the chamfering will vary in a stepless way.

The invention will be explained in more detail in the following description, with reference to the drawing, in which:—

Fig. 1 shows a chamfering device according to the invention, seen from one end;

Fig. 2 is a lateral view of the same, partly in section along the line II—II in Fig. 1.

The device consists of a cylindrical block 1, one end face of which is provided with a number of parallel-sided circular slots 16, 2, 3, 4 having a common tangent plane at the left side of the block 1. At this place is provided a chamfering tool 5 having a cutting edge 6. The chamfering tool 5 is inserted into a rectangular hole in the block 1, in which it is slidable and can be fixed at any desired adjusted position by means of a screw 7. In the projecting circumferential zone of the block 1, there is an obliquely directed slot 8, through which the chips produced by the chamfering process can be removed.

Diametrically opposite the chamfering tool 5 is placed a corresponding chamfering tool 9, the cutting edge 10 of which, however, lies at the outer side of the largest circular slot 4, so that this chamfering tool 9 serves to chamfer the tubes externally, while the chamfering tool 5 is intended for internal chamfering of tubes. At the chamfering tool 9, there is also an obliquely directed slot 15 in the circumferential zone of the block 1 for leading the chips away from the device. Associated with the chamfering tool 9 is another set of circular slots 12, 13, 14, which intersect the formerly mentioned slots 2, 3, 4. The slot 4 is also associated with the chamfering tool 9, as a tube end placed in the slot 4 can be chamfered externally by the chamfering tool 9, and internally by the chamfering tool 5. The two chamferings, however, cannot be made at the same time, as the direction of rotation of the tube is different in the two cases.

At the rear side, the device is provided with a handle 17, by means of which the device can be held in a fixed position. The device may be made from one piece of silumine or plastic.

In Figure 1 is shown a portion of a tube 18 inserted into and guided in the slot 2 and being chamfered internally by the chamfering tool 5, when it is rotated in the direction indicated by the arrow. If an external chamfering of this tube is also wanted, the chamfering tool 5 is removed from the rectangular hole in the block 1, rotated 180° about its own longitudinal axis, and inserted again in the hole, so that the cutting edge 6 will turn the opposite way and will be positioned further away from the centre of the block 1. The chamfering tool 5 is fixed again by means of the screw 7, and the device is then ready to chamfer the tube 18 externally, when the tube is rotated in a direction opposite to that indicated by the arrow.

If the width of the chamfering is to be changed, this may be done by sliding the chamfering tool 5 or 9 in its longitudinal direction and fixing it in the new position by means of the screw 7 or 11. A change of the chamfering angle can only be obtained by grinding the chamfering tool 5 and 9 in such a way that the cutting edge 6 or 10 makes another angle with the parallel sides of the circular slots 16, 2, 3, 4, 12, 13, 14.

Instead of the handle 17, the device may be provided with means for securing it to a vertical or horizontal surface.

WHAT I CLAIM IS:—

1. A device for chamfering an end face of a circularly cross-sectioned tube, comprising a block provided with at least one chamfering tool and a plurality of parallel-sided circular slots corresponding to the desired tube dimension.

2. A device according to Claim 1, in which the slots are arranged to have a common tangent plane at the position of said chamfering tool.

3. A device according to Claim 1 or 2, wherein the block has two or more chamfering tools, each tool having a respective group of parallel-sided circular slots with the groups intersecting each other.

4. A device according to Claim 1, 2 or 3, wherein the or each chamfering tool, as the case may be, is received into a rectangular hole in the block.

5. A device according to Claim 4, wherein the axis of the or each rectangular hole, as the case may be, is substantially parallel to the axis of the slots, the or each chamfering tool being slidable in its hole and fixable in any axial position.

6. A device according to any preceding claim, wherein the block is provided with a handle such that the device may be held in a fixed position.

7. A device according to any of Claims 1 to 5, wherein the device is arranged to be

securable to a vertical or a horizontal surface.

8. A device according to Claim 7, substantially as described, with reference to the accompanying drawing.

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1 SHEET. This drawing is a reproduction of the Original on a reduced scale

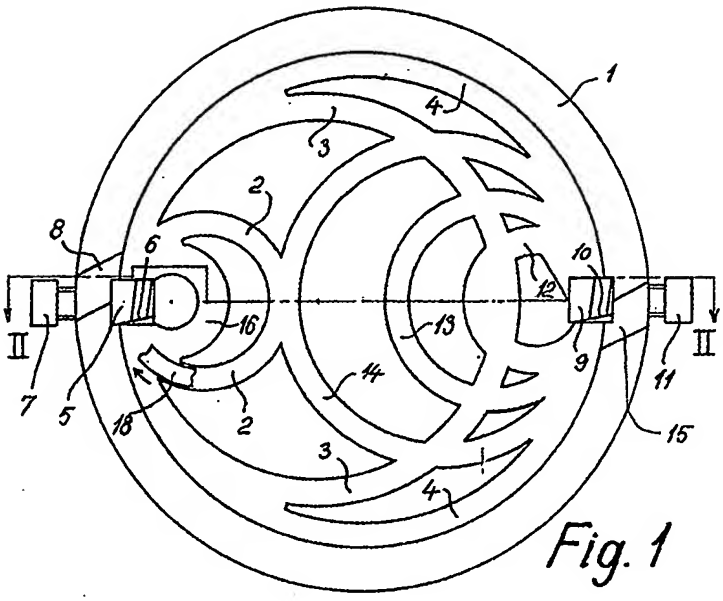


Fig. 1

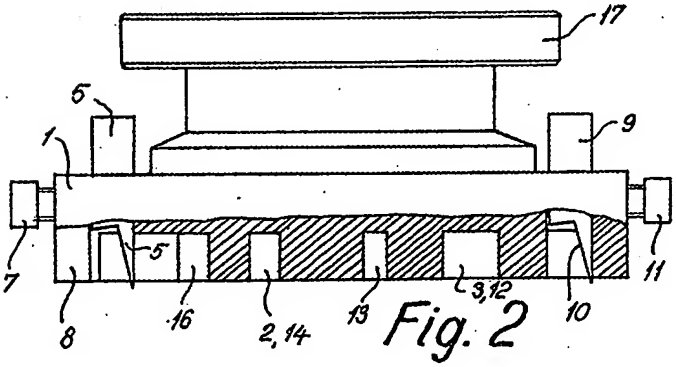


Fig. 2